

# AMATEUR RADIO



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THE PHILIPS transmitting valves indicated below are excellently adapted for use by amateurs.

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	TO 03/5	TO 04/10	TC 1/75	TB 2/250	QC 05/15	QB 2/75	
Filament voltage .. . . .	4.0	4.0	10.0	11.0	4.0	10.0	V
Filament current* .. . . .	0.29	1	1.6	3.8	1	3.25	A
Saturation current* .. . . .	100	400	1500	2000	400	2000	mA
Anode voltage .. . . .	150-300	200-500	800-1500	1000-2000	400-500	2000	V
Screen-grid voltage .. . . .	—	—	—	—	75-125	300-500	V
Max. anode dissipation .. . .	6	10	75	150	15	75	W
Anode dissipation on test ..	10	20	100	200	20	100	W
Max. screen-grid dissipation .	—	—	—	—	3	15	W
Amplification factor* .. . .	6	25	25	25	225	200	
Mutual conductance (slope)*	2.3	2.0	5	4	1.4	1.4	mA/V
Int. resistance* .. . . .	2500	12,500	5000	6000	160,000	150,000	R
Anode-grid capacity .. . . .	—	—	—	—	.001	.02	mm/F

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## EDITORIAL

It is with a feeling of pride that December "Amateur Radio" is presented with twelve pages more than our inaugural issue. This speaks volumes for the reception that has been accorded our magazine throughout Australia. Ham Radio here, in the same manner as in the rest of the world, must find a means of expressing itself, in order to more effectively tie the bonds which cement us into one big brotherhood and ensure our forward progress. Our journal provides us with a medium not only to keep us conversant with what the other fellow is doing, but also for the dissemination of information on what our experimenters are achieving. Amateurs are proud at the great part they have played in the History of Radio Knowledge, but it must be remembered that practically all Ham achievements, in the past, have been the result of individual experimentation.

As every amateur knows, the justification of our very existence, as holders of experimental licences, is dependent upon our contributions to Radio knowledge and our service to the community at large. The R.A.A.F. Wireless Reserve is undoubtedly a community asset, and in a time of national stress would be able to do an invaluable service. But, in the matter of experiment and research, our ideas and views must assuredly undergo a radical change. To-day is the day of combined, organised effort, and it will only be by collective group

experiment, when the brains and initiative of a number are amalgamated towards a common end, that future results commensurate with those of the past will be attained. It means, in effect, that we must aim for closer co-operation in all things connected with our Hobby.

Our magazine is a potential asset to the cause of Amateur Radio here in Australia. By making its success a certainty we help ourselves in a manner beyond comprehension. Increased circulation and direct support to our advertisers is the keynote to our continued success. Purchase only from those advertising in YOUR journal, and, at the same time, establish goodwill by mentioning "Amateur Radio."

\* \* \*

As we go to press we are mindful of the prevailing Christmas spirit. We extend to all Radio Amateurs of Australia and those overseas our heartfelt seasonal greetings. May the New Year bring you DX and Radio friendships hitherto unknown. May "Amateur Radio" progress from boyhood to manhood in the manner it is growing to-day. May "Amateur Radio," your magazine, go down through the ages of Ham Radio as the finest publication of its type in Australia. Once again, in all sincerity, we wish our readers a Merry Christmas and all the happiness, prosperity and good fortune that the New Year may have in store.

THE EDITORS.

# An Economical Vacuum Tube Voltmeter

By G. GLOVER, A.M.I.R.E.

A modern receiver, like the Single-Sig-Super calls for something more than mere voltage, current and component tests. In fact, it demands very accurate alignment if the high sensitivity and selectivity of which it is capable are to be fully realised.

To align such a receiver correctly one needs two instruments:—

- (a) Controllable source of R.F. energy, such as Modulated Oscillator\*;
- (b) Resonance Indicator, such as Vacuum Tube Voltmeter (V.T.V.) or Rectifier type Output Meter.†

In this article the writer proposes to deal with the former type of Resonance Indicator only.

The diagram represents a circuit of V.T.V. employing cumulative grid rectification. This represents not only the most economical, but also the safest, form of V.T.V. to employ for this purpose. By safety the writer refers to the fact that with this type of rectification signal overload results in considerable decrease in anode current. Hence there is no fear of burning out or damaging the meter, as in the case of anode-bend-rectification, when signal overload results in increased anode current of dangerous magnitude.

## Practical Considerations.

The simplest form of construction consists of a panel, upon which terminals or sockets for connections, adjustable resistor R2 and meter are mounted. If so desired, economy may be effected by using plugs and sockets in conjunction with meter, thus releasing the meter for other work, a method extensively employed commercially. The meter itself may have a range of either 500 micro-amperes, 1.0, or 1.5 milli-amperes.

One word of warning with regard to the panel. Do not employ Ebonite, as most Hams have a habit of leaving apparatus lying about, and daylight soon oxidises Ebonite and ruins its insulating qualities.

Shielding is unnecessary, as the meter is only intended for comparative readings, and external fields remain more or less constant under a given set of conditions, such as one encounters when aligning the receiver. Hence such fields need not be seriously considered.

Valve may be either D.C., A.C. or battery type, providing it has requisite characteristics for rectifier, such as American 199, OIA', or 27', Philips 09, 15' or 24'. Any English valve having similar characteristics may also be employed.

## Practical Operation.

Adjust anode voltage, using battery tappings, in conjunction with Rotation of R2 until meter indicates full scale. Now attach cathode to same earth as receiver and connection from grid condenser to anode of valve or circuit from which measurement is desired. The writer strongly recommends the use of Belden Shielded Cable and alligator clips for this purpose, the shielding of the cable serving the dual purpose of earth connection and shield.

Resonance during the process of alignment of Receiver will be indicated by the greatest reduction in anode current, or, in other words, the greatest dip of meter.

The unusual sensitivity of V.T.V. enables one readily to locate correct adjustment of I.F. Oscillator and Aerial circuits, and when adjusting I.F. circuits grid clip of V.T.V. may be progressively moved from anode of first I.F. to anode of second detector without interfering with the operation of the receiver appreciably.

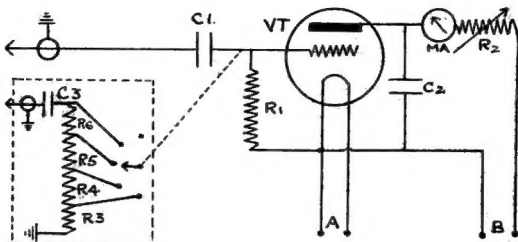
Final adjustments can be made by reducing sensitivity of meter and connecting clip to output tube. Hence provision of tapped resistor and condenser C3 (shown in dotted lines in diagram). The addition of this section of apparatus is optional.

In conclusion readers are warned that R2 will have to be readjusted every time value of grid-leak is changed, owing to grid current effects. It might be of interest to some readers to outline effect of R2 on sensitivity. As current tends to decrease so does voltage drop across R2. This in turn causes application of higher voltage to anode of valve, the net result being in effect reduction in sensitivity due to opposition of R2 to reduction of current flow.

\*Described elsewhere in this issue.

†As individual tastes may differ, next month we hope to publish details of a Rectifier Output Meter by VK3RS.





C1, 100 mmfd., R3, .1 meg.

C2, 1 to 4 mfd., R4, .25 meg.

C3, .01 mfd., R5, .5 meg.

R1, 10 megs., R6, .5 meg

R2, 100,000 ohms, VT, see text.

## INTERNATIONAL NEWS

### AMERICAN NOTES.

By Harry Washburn, W2CL.

(By Radio, via VK3RJ.)

The Byrd Antarctic Expedition left Boston on September 25th for the Antarctic, via Panama, and should shortly arrive in New Zealand waters. Two ships are conveying the expedition. The Bear of Oakland, whose call sign is WHEW, has for its radio operator Dick Watson, W1BGL. The other vessel is the Jacob Rupert, under the call sign KJTY. Both ships have 1-kw. transmitters, working on frequencies of 8280 kc., 11,240 kc., and 12,420 kc. At present they are working amateurs in the 7 mc. band and answering on 8280 kc. When bases are established it is the intention to set up outfits, but as yet no word of the frequencies to be utilised by the base stations is to hand.

Winter conditions have set in on the eastern half of the U.S.A., and for a few hours after sunset few signals are to be heard on the 7 mc. band.

Proof that numbers of East Coast hams are conforming to the recent regulations prohibiting modulated CW signals may easily be noticed on the 7 mc. band, where the intensity of the QRM has diminished to a surprising degree.

## B.E.R.U. NOTES, VIA G2ZQ, ZL4AO, VK2HC.

November.

The most important event of the month was the 3.5 mc. contest, which had the support of about 50 G stations. High scores are predicted. W and VE signals have been heard on that band, but only one contact (G6FV and VE1BV) has yet been recorded.

Mr. F. Neill, G15NJ, has been awarded a WBE telephony certificate and thus becomes the first member in the Empire to qualify for a WAC and WBE on both CW and telephony.

The band occupancy checks taken during September showed no less than 706 individual G stations active on one or more bands, an increase of nearly 200 since the March checks.

The rules for the 1934 B.E.R.U. contests appear in the November issue of the "T and R. Bulletin."

### Harmonics.

P. Hardgrave (VK4PH) advises that he is maintaining a strict schedule of Morse practice on 7176 kc. (41.8 metres), (crystal control), every Monday and Thursday from 1800 to 2000 [presumably E.A.S.T.—Ed.] He is transmitting at varying rates of 4, 8 and 12 words per minute, and is particularly anxious to receive reports on his broadcasts. His address is "Arawatta," 285 Montague road, South Brisbane.

## A UNIVERSAL FREQUENCY METER.

By H.R.J. (VK3LH).

Since the application of the electron coupled circuit to frequency meters the poor old dynatron has been given the go-by. The application of the dynatron circuit to an oscillator produces a testing instrument for the service man, and a frequency measuring instrument for the amateur. The dynatron is versatile, stable and efficient, and, provided it is properly constructed, using good components, can be calibrated accurately, so that it will perform the functions of an expensive laboratory instrument. Moreover, it will maintain its accuracy indefinitely.

The instrument to be described is very easy to construct, and can be assembled in an aluminium box measuring 4½ inches wide, 7½ inches long and 6 inches deep.

The circuit has a number of interesting features. First of all, no batteries are required, and the oscillator can be used on either A.C. or D.C., according to the power supply available, and should be of interest to the country ham where D.C. only is available.

When used on D.C., modulation is obtained for testing purposes by means of the commutator ripple. On D.C. the positive terminal of the mains plug must go to end of resistor (9) and the negative to switch (10), and then directly to the filament.

A type '22 screen grid valve is used, and operated at such voltages that oscillations are produced when the tuned circuit is connected in series with the plate.

The tuned circuit consists of a plug-in coil, shunted by a variable condenser of the S.L.F. type.

The necessity for an accurate condenser and coil cannot be emphasised too strongly.

In order to cover a range from 3 to 550 metres, three coils are used; directions for coils are given below.

In order to keep the Broadcast coil small and compact, this is calculated with an inductance of 560 microhenries, so that it covers a band from 300 to 550 metres when tuned with a capacity of .00014 mf.

By taking advantage of the second, third and fourth harmonics, it is possible to tune the circuit to any desired spot between 3 and 550 metres. Extreme care, however, must be taken not to get on the wrong harmonic

when working on the higher frequency bands.

When the oscillator is to be used for the purpose of superheterodyne testing, a honeycomb coil may be substituted at (2). This oscillator may also be used to generate audio frequencies by inserting the primary of an audio transformer in the plate circuit of the tube.

The various required filament, plate and grid voltages are obtained by means of the voltage drop across the resistors (6), (7), (8) and (9). (It will be noted that the control grid is connected directly to the filament.) The four resistances are in series across the 230 volt mains. Resistance (9) reduces the voltage to about 60 volts, which is applied to the screen grid. Resistance (8) reduces the voltage for the plate. There is an (IR) drop of 3 volts (plus) across resistance (6) to provide the proper filament voltage. When used in conjunction with an output meter it makes a useful instrument for lining up the RF stages of a B/C receiver.

The Coils are as follows:—

Broadcast range, 300 to 550 metres. On a 2 inch diameter former wind on 130 turns of No. 28. In the original circuit enamel wire was used on all coils.

18 to 100 metres:—20 turns No. 26 enamel wire.

3 to 35 metres:—5 turns No. 24 enamel wire.

If trouble is found in calibrating from the harmonics, three coils can be wound to cover the range from 18 to 100 metres, using the harmonics of the 15 to 35 metre coil (5 turns) to drop to the ultra high frequencies.

.00014 mfd. SLF variable (3).

1 mf. (4 and 5).

150 ohms 25 watt (7).

1000 ohms 25 watt (6).

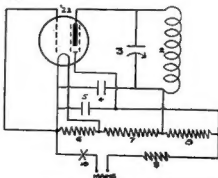
750 ohms 25 watt (9).

1000 ohms 25 watt (8).

AC toggle switch (10).

UX sockets.

Type '22 tube.



## SIMPLE PORTABLE POWER SUPPLY.\*

By VK6SA.

A Ford coil could be rewound to give, say, 300 volts, without the necessity of condensers to drag it down, but something designed specially for the job would no doubt be much better. No one would think of building a filament or a power transformer on an open core, owing to the low efficiency that would be obtained owing to the magnetic leakage, so why not build the transformer with a closed core for the job in hand.

I have tried various designs with considerable success, and the one in use will put 10 watts into a 201 when operating from a 6 volt accumulator. I have run it off four dry cells, but this is NOT economical. It is advisable to fit a safety gap across the secondary, so that HV surges will pass across it and save damaging the components. It might be that the output from these coils is not pure AC, and with the open type of core the voltage on the make of the circuit will probably be less than half of the voltage produced on the break. With the closed core job the difference is not so great, being about 75 per cent.

One of the main items needed to get a good output is a good interrupter. It is quite simple to get a fine, high-pitched note from a test buzzer, but when several amps are to be broken up it is a different matter. Vibrators made from Ford coil parts are fairly successful, but the contacts need frequent renewal and cleaning. With the open core type a fairly large condenser is needed across the contacts for two reasons—to get maximum output and to prevent arcing. With the closed core a condenser will make very little difference at all. With the open core the vibrator is usually made to operate on the magnetic pull of the core itself; but, of course, this is not possible with the closed type. An independent vibrator will be found the best, worked in a similar manner to the old Master Vibrator units on the old Fords.

It is quite reasonable to assume that the closed core job will be more efficient for what we want. The best one tried to date utilised the core of an old choke; core  $\frac{3}{4}$  thick, by 1 by 1.

Primary wound with 50 turns of SCE.

Secondary wound with 3000 turns of 36 enamel.

This gives around 400 volts on load. No load volts are likely to surge and puncture the condenser, etc., therefore the safety gap.

An ordinary core type of transformer could be used, but it is not so compact. The interrupter is the next item, and the high note is the objective. This is obtained by filing the blade till it is thin and very flexible.

\*[The above is an extract taken from a lecture given by VK6SA. After dealing with the many types of supply possible, VK6SA states that the one described above is the most efficient, and, moreover, is foolproof.—Ed. "A.R."]

## HERE'S A DRAMA BY 3AH.

(From Ray White, VK3AH,  
Shirreff street, Stawell.)

The place is interior of a ham shack. Time is 1 minute and 70 seconds after ham has dropped Reiss mike and let granules escape. Curtain rises on ham bearing stick of brush carbon and hammer. At given signal ham grasps hammer firmly in right hand and proceeds to take vengeance on carbon. Having made a horrible mess of the room in general, and the carbon in particular, our hero gathers up as much of the carbon powder as possible, and sifts this through an old pair of the YL's (well, perhaps we'd better not say it). However, some muslin will do instead. Ham now seizes newspaper, and, having tipped the sifted carbon out on a sheet of this, commences to give an impersonation of a prospector panning dirt. In other words, he rotates the sheet in a horizontal plane, causing the granules to run over it. This treatment soon causes the paper to go black, so a new sheet is taken and dealt with in a similar manner. As each sheet is "declared black" the carbon is transferred to a fresh one. Seconds pass. Minutes pass. Even hours pass, but sooner or later there comes a time when no amount of rotation, oscillation, tintinnabulation, etc., will make the paper darken. The carbon granules have now been roughly polished and all dust has been removed from them and deposited on ham's perspiring face and Sunday clothes. Ham fills mike again.

(Curtain.)

# VK3 SECTION NOTES

## Key Section

Conducted by J. H. Winton (VK3XR).

At the meeting held on 8th November we again had a very good muster, and the following new members were welcomed by the Persident:—3ZC, 3XL and 3KT. VK2OA, who is a "sparks" on the H.M.A.S. Canberra, was also present, and entertained the gang with a description of the gear carried on a warship. He rather amazed us when he talked of low power of a few kilowatts, and 30 amps. in the aerial! However, when he stated that the effective range was about 2000 miles we were reassured.

Apparently some of the members have been doing quite a lot of hard thinking during the past month, and as a result it was announced that at each meeting arrangements would be made for one of the gang to give a short account of the highlights of his ham career. To start the ball rolling Max Howden has kindly agreed to entertain us at the December meeting with an account of some of his early history-making experiments. So make up your minds now, fellows, not to miss the 5th December, and if your friends are interested, by all means bring them along, as we are only too happy to have them attend.

But this is not the only thing which has been causing headaches. For some time past we have felt that some additional incentive to the experimental side of amateur radio has been sadly lacking in our midst. Particularly noticeable has this become since consistent long distance communication has been proved within the reach of very QRP rigs. Expense, however, has proved the stumbling block of more than one would-be experimenter when endeavouring to put his pet theory to the test, and it was with a view to overcoming this obstacle that the following plan was devised.

Broadly speaking it consists of forming the hams into groups, so that they can work together on their own problems or lines of experiment suggested by the key section. These groups will meet together as often as required, and by pooling apparatus accomplish much more than would be individually possible. Furthermore, at the conclusion of their research

they would be asked to read a paper to the meeting on the results, and any worth-while developments incorporated in an article in "Amateur Radio."

Some of the subjects for investigation are listed below:—

Five-metre Apparatus and Conditions.

Antenna and Feeder Systems.

Interference—Key Click Filters.

Interstage Transmitter Coupling.

Harmonic Output Oscillators.

Modulation.

Selective Receivers.

Efficiency in Output Amplifier.

Portables—Power Supply.

Now, fellows, let's get together and give this idea some thought. Here are some reasons why we should support this scheme:—It will increase our knowledge of the science we all like. It justifies our holding an amateur ticket. It will surely contribute to the world's knowledge of radio. It will give each of us a chance of winning the trophy presented annually for the year's outstanding development in amateur radio, and, last, but not least, it will provide a rich source of material for "Amateur Radjo." Let's give it a try, fellows!

Considerable work has already been done on VK3WI, the short wave station, and it will very shortly be operating on 40 mx and 80 mx. The 80 mx rig is a B443 C.O. and F443 P.A., with 400 volts DC from the mains on the plate. On 40 mx the old 3WU rig will be used. This is an AC job which gets its juice from a converter delivering 220 volts at 40 cycles. Using a Philips 50 watt bottle in the P.A., with 1000 volts on the plate, a fair signal should be pushed through. Schedules have now been drawn up for operating on Monday, Wednesday and Friday nights each week, and will commence immediately the rigs are ready. Look for 3WI and give us a call; we will be very pleased to QSO.

We were very pleased to hear that after an absence of 18 months from the key 3KN is now back burning the watts and the midnight oil. He is at present playing on 80 mx with Telefunken mod. on a TC.04/10, which he says is O.K. Let's hope it is. 3KT is also playing with modulation, this time Class B, and wants to know whether someone has taken the high notes out of his records. 3AX reports

that recently he worked seven Yanks between midnight and 2 a.m. After that we think that perhaps there is something in this DX business that keeps us up at night.

While on a trip up north 3PS called in on 3JK at Wangaratta. The latter is a dentist whose main hobby appears to be extracting unwilling molars from the local inebriates. Unfortunately for ham radio, he is rather QRL at present, but hopes to be making a big noise with Telefunken modulation soon. 3JK evidently believes in ultra-high frequency work, judging by the way he handles his X-Ray apparatus.

Experiments with quiescent push-pull are well under way at 3PS and 3XR. Developed in England, it is primarily designed for efficiency in battery-operated sets, it being possible to obtain 1.3 watts with an average current drain of less than one milliampere. The principle appears to be quite adaptable to amateur requirements, however, and it is hoped that an article on a cheap modulator unit will be available shortly. For the present, however, tests are being limited to its usefulness as a final stage for battery-operated sets.

---

### VK3 Phone Notes

At the Phone Section meeting on Tuesday, November 14, a motion was carried to the effect that, in keeping with the new arrangement whereby allocations will not come into action until the first Sunday in the following month, our meeting nights are changed to the last Tuesday in the month. It was agreed that starting out with the new allocations on the first Sunday in the month was advantageous from various points of view, one of which was that it is obviously more on the lines of a definite system.

The subject of compulsory crystal control (or it was suggested we should use the term "piezo-electric control," as being more explicit) is still being much discussed, although the motion has been carried. A lot of people had much to say at the November meeting on the subject, not really that of piezo-electric control, but the organisation of a crystal pool, which must be provided, of course, as a consequence of the above motion. Some members did not quite like the idea

of passing in their crystal to be handed over to someone else, for fear of possible damage; but they were assured that suitable checking arrangements would be provided and a suggestion was made that members might put in a very small sum each month to a fund to provide for the maintenance of the crystals, also a possible replacement when necessary. There is really nothing that could seriously mar quite simple arrangements, as some members suspect. For instance, someone asked what would happen if four crystals arrived which were on the same frequency? This does not matter one little bit, since that frequency would be the particular one where there are at present four stations sharing the same frequency over the four Sunday sessions.

It is obvious, if one views the subject from the straightforward standpoint, everything becomes automatic, since every station will provide one crystal for the pool, being a crystal ground for the frequency on which that station is working, there will be available to all stations a crystal for the frequency to which they are allocated, be it a new one or their previous one.

Of the regular applicants for frequency allocations, two failed to send in applications. The allocations committee, after questioning the meeting to see if anyone was representing these people, carried on with the business, leaving these stations out. One of these stations did send in a notice to say that it would be out of action for the present. This brings to notice a rule which is by no means new, that members must send or bring along written applications for frequency allocation. Failure to apply will be taken as notice that a frequency is not required. This will assist greatly the allocations committee in their work.

The discussions then turned to the subject of the "Gadsden trophy." It was agreed to hold a competition, to include all stations in this section, country and city. We decided to elect a committee to deal with the arrangements which are necessary to stage this contest, and same was duly elected, comprising:—Mr. C. McPherson, 3LU; Mr. O. Holst, 3BY; Mr. J. Kling, 3JB; Mr. G. Thompson, 3TH, president Vic. Division; the chairman and secretary of the Phone Section, Mr. R. Dalton, 3UI; and myself, 3DH. It was agreed that we meet on

Tuesday, November 21, to carry on with the arrangements.

At this meeting Mr. G. Thompson moved that the competition be held on a date to be fixed, to include country and town stations, and that they should get their applications in at an early date. Handicaps will certainly be arranged which will give the man with lower power a better opportunity; in fact, the ultimate perfection, if it were possible, will be to bring all stations to a dead-heat. Further proposals are, to spread the whole competition over a much larger period than any previous one, possibly months.

On the last occasion stations were given something like half-hour sessions, to enable the whole number to be accommodated on a couple of Sundays, but we will probably make use of Saturday and Sunday nights only in this case, giving one and a half hours to each station, and that station will be the only one on the air during the actual test period.

The object of the night transmissions is to make possible portion of the judging to be made outside of Australia. Then there is the subject of "stunts." This idea met with the wholehearted approval of the phone meeting, and will undoubtedly give the chaps some scope for their technical abilities. It will not be necessary to put up a stunt in the elimination tests, but the proposed six finalists will be required to do so. To avoid the natural human possibility of one station improving on, say, the stunt of the last station heard, the finalists will be required to send along to the Institute a sealed description of their pet stunt, and they will be bound to adhere to the original proposals as set out in the sealed description as held by the Institute, and which will not be opened until that station is actually about to put on its transmission.

To enlarge on the "stunt" subject, it is rather a vague expression, so certain limitations must be made. Firstly, only the station's regular operators and off-siders will be permitted to take part in the transmission and the stunt; secondly, it must be strictly of a technical nature. That may sound a lot, but just have a think over it, "gang." There are plenty of things to do, and finally no other station may actively take part in the "stunt" at the time of actual transmission. All these details are still

open for discussion, and if the members can think up anything further, let us have it at the next meeting; there is still plenty of time to pick to pieces the whole affair, but we have started on the job now, and if we are very early, if the competition cannot be staged for months yet, due to weather conditions making reception at a distance bad, so much the better; there will be ample time to have the organisation perfect. On going further into the matter, from the point of view of amplitude of signals at distant points, the question of operating frequency came up. A most sound suggestion was made by Mr. G. Thompson, namely, that a fixed single frequency be decided upon and all competitors transmit on that frequency, using the same crystal which would be provided by the Institute. This makes the job of the handicappers a more reasonable one, since all stations would be working under identical conditions, commencing with the actual crystal. The Committee could not see any weak points about this proposal, because under any circumstances there is very little likelihood of any station not using a piezo-electric method of frequency control, and therefore the judges would hardly, with ordinary equipment, be able to make much use of points allotted for stability of operating frequency.

In conclusion, it would be as well to remind the phone gang that there will not be a meeting in December. The next phone meeting will take place on the last Tuesday in January, 1934, also the allocations made at the November meeting will become effective from the first Sunday in December, that is, December 3, and continue until the last Sunday in January.

There was also a motion carried to defer until the next meeting the compulsory use of piezo-electric control of stations on and above 199.9 metres.

I would like to take the opportunity of wishing the "gang" all the very best for Christmas and the New Year.

Ivor Morgan, VK3DH.

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### HARMONICS.

5LP is on now with P.P., T.P., T.G., 45s. Laurie is a fb. rag chewer, and it's well worth the power to give him a call. Remember, boys, Laurie can't walk like us, so radio is his hobby and helps to pass the time and long, dreary hours of sickness. Don't forget to give him a shout.

## Shortwave Group W.I.A. (Victoria)

Owing to a misunderstanding our notes for the last issue did not reach the Editor in time, so they were unfortunately excluded.

Our Director and Investigation Officer (Mr. Sones) recently gave a very interesting lecture on "The Tuning Problems in All Wave Receivers." This subject is arousing a great deal of interest, and Mr. Sone has devoted many months of study to its development. After exhaustive experiments with split stators, series condensers, etc., a new idea suggested itself, the idea being that the normal .0005 or .00045 mfd. tuning condenser could be used for tuning both the medium and short wave lengths, so that the necessary coils would be limited to two per stage.

The various short wave broadcast bands could be spotted on the main dial, and then opened out by small ganged, parallel trimmers. The idea offers many possibilities, and preliminary work has already been done.

By the use of a signal generator it was found that by using a certain number of turns on the coil it was possible to tune from below 19 metres to a little above 50 metres, in one swing of the condenser.

Members of this group are those who are particularly interested in the reception of overseas broadcast and radiophone stations, and all are actively engaged in tabulating reception results. Very good work in this direction is being done by our country member, Mr. Cameron, who sends us regularly charts showing the various signal strengths, etc., of short wave stations heard in the Western District.

At the end of twelve months' observations the results are collated, and the annual signal variation or cycle is drawn up in graph form.

The results then show us the times for the maximum signal intensity at any part of the year, and for any particular wave length or station. Owing to leave being granted Mr. Sones, we regret to say that he will not be with us at the next meeting, but arrangements have been made for a lecture by one of the members on some current item of interest.

The next meeting will be held in the W.I.A. rooms, 4th floor, Kelvin Hall, on Wednesday, December 13,

and as this will be near Christmas it will probably be our final meeting for the year 1933.

Please note that meetings are held twice monthly—on the second and fourth Wednesdays of each month.

Address your inquiries to the Secretary, Short Wave Group, W.I.A., Kelvin Hall, Collins place, Melbourne.

C. M. SCOTT, Secy.

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## NEWS FROM FEDERAL HEADQUARTERS

By G. B. Ragless, Federal Publicity Officer.

This is the first opportunity I have had of giving members of the Institute an insight into recent doings and work under way by members of the Federal executive.

I would like to say how pleased we are to see a magazine published in Australia solely for hams, and the Victorian Division is to be congratulated on its enterprise. This magazine is the official organ of the whole Institute, and fills a long felt want in our activities. It is the duty of every member—nay, every ham in Australia—to give it his full moral and financial support.

### Fisk Trophy Competition.

It was very pleasing to the Federal executive to see the enthusiasm with which this contest was received, and it indicates a bright future for the coming tests. The rivalry among the States and the keen competition among the individual stations in the various States was most striking. The trophy is well worth winning, and even if it adorns the clubrooms only temporarily it will always be keenly fought for by the States. We hope that the trophy changes hands many times and travels all over the Commonwealth before the five contests decide the permanent holders.

Full results are expected to appear in the next issue.

### Last Annual Convention.

It will be remembered that after the last Convention a deputation waited on Mr. Malone, Chief Inspector of Wireless, and discussed various matters with him.

Inquiries were made by the department into two of the subjects raised, and an answer was received some time ago indicating that the department

could not allow third-party message handling, and would not raise the 25 watt limit to 100. In regard to the latter it was pointed out that the department would favourably consider granting permits to individuals for the use of high power.

## 10th Annual Convention.

Federal executive has decided that the next Convention of the Institute will be held in Adelaide towards the end of January, although the exact date has not yet been decided upon.

It is hoped that all Divisions will send a representative, and as a means of reducing the expense we are arranging for visitors to stay with local hams if desired. We suggest that the more distant Divisions find a suitable delegate desirous of making a holiday trip and arrange it to fit in with the Convention. Every member of the Institute who has a matter of importance to raise should get in touch with his Divisional Council and request that it be placed on the agenda. Business must be decided at this Convention that will vitally affect the future of the Institute.

## General.

On behalf of the Federal executive I desire to offer the season's greetings to the Councils and members of all Divisions, and trust that 1934 will be a year of further progress and success for the Institute throughout the Commonwealth.

## THE ASSOCIATION OF RADIO AMATEURS (N.S.W.)

### GENERAL A.R.A. NOTES.

The executive of the A.R.A. takes this opportunity of thanking those zone officers and members of the A.R.A. who by their notes and subscriptions have assured "Amateur Radio" of at least a fair support in New South Wales. However, the number of copies of the November issue sold in New South Wales does not, by a very wide margin, equal the sales in Victoria, so once again we appeal to you all to increase your support, as we wish to make the December sales double those of November. Subscriptions should be sent to either A.R.A. zone officers or to the Secretary. 2YC (phone B5786) will be pleased to re-

ceive notes of interest from city and suburban members for publication.

The big event of the month, within the A.R.A. ranks, was the field day held at Toowoomb, near Gosford, on Sunday, November 5. A wonderful roll-up of members was secured. As the A.R.A. star reporter for the day (2LZ), has been paid a "princely fee" for a special article (appearing elsewhere) on the doings of the day we shall not infringe.

The A.R.A. extends seasonal greetings to the Federal Executive, all Divisions of the W.I.A., and all radio organisations and "hams" throughout the Commonwealth, and trusts that interest in "Amateur Radio" will be more than maintained during the coming twelve months, and that this interest will be reflected in a growing popularity of "Amateur Radio," with consequent increase in sales.

FRANCIS M. GOYEN, President.

ROBERT H. W. POWER, Secy.

Wembley House, 841 George street,  
Sydney.

## ZONE 2.

Here's November with us, and for a wonder the QRN has not been nearly as bad as it was early last month, making DX more of a pleasure than it would otherwise be. The Quirindi gang are always on the lookout for a rag-chew, and very active; but not much has been heard of the New England boys of late. How come, OM's? 2WT has not been heard here for months. 2CR is on occasionally. The evergreen Cess of 2KR still punching the key day and night. He gets out remarkably well with a real 3½ watts input.

Last Sunday week was a real ham-fest at 2HC, when 2KR, 2FE (from the Garden of Eden), 2KR, 2MO (our local BC station) and 2EG paid him a visit. All the spare junk had been cleared out of sight, so the gang didn't have to keep their hands in their pockets. Hi. 2KN has been off temporarily, owing to something (?) wrong with his F203's, Hi.

2JF, I hear, is about to start up again. Ole John is still plugging away, and has improved on that bug, though the dots still splash and hit sometimes. He has had to spend a deal of his time explaining to the gang that he is now 2XQ and was 2BE.

2EG has taken 2XQ's tip and migrated to 20 MX, and first call got



R7 from J5CH. 2XQ has worked G, ON, PA, PK, OK, and OH, all in one night on 20.

Heard the first South American for months on 40 MX recently, OA4S, QSA5, R6, CC about 4.30 p.m. 2EG has his rig going O.K. now, and started off well in the tests, but QRM prevented keeping of skeds. Ole Roy, out in the cactus, has been and gone and done it, and I'm sure all the gang join me in heartiest congratulations on his engagement. FB YL, too. Best luck to Mrs. 2HC, 2BE, Hi! Hi! 2LM heard often with R8 fone on 80 MX, but not nearly as consistent as he used to be.

Well, boys, keep a look-out for the gang up here in the cactus.

IVAN (2EG),

A.R.A. 2nd Zone Officer.

## ZONE 3.

During last month conditions were punk on the North Coast, QRN almost every night, with most of the gang QRT. VK2YK has been very much alive with his QRP rig, and, using a 40 metre crystal, is doing FB DX on 20 and 40 metres. Roy is using "B" batts. and 230 valves in his rig. He has also built up a 5-metre RX, using one 230, and will take this with him to Newcastle, where he will spend his Xmas holidays. 2GM hasn't had time to get on the air lately, QRL writing. 2GI, 2AO and 2CU have not been heard for the last three months. 2OU has not been heard on account of skip, but Sid. is too active a ham to be off the air: Can anyone supply Sid. with a 1.5 volt Trani? 2ZM is very consistent on 80 fone, using M.O.P.A. 2NY is a new ham at Grafton. 2GK is still building that RX, having taken eighteen months so far!

The Pirate Using the Call of VK2DG (?) if he has any sentiment would refrain from using this call, as QSL's are coming into the QRA of the late 2DG.

Conditions on 20 metres about 3 p.m. on Sundays are FB up north. South America and Africa have been heard on the last two Sundays. One South American station that was standing by for VK2 was coming in R8, using 2 valves RX. The J's come in about 4.30 p.m. All VK was heard, and ZL and the W's can be heard any old time. 40 metre DX here in the early AM is NG these last two weeks, although 2XQ has been getting FB

reports from G on this band. QSA5, R6. 2XO has not been very active of late, but is on 80 metres every Sunday night to stand by for any notes from the Zone 3 gang. Let's have some of your doings, boys. 2XO will be going on his Xmas holidays next month, and will take the portable 2FE with him, using "B" batts. and Ford coil for H.T., and will be pleased to tell the gang about the big fish that got away, Hi!

You all know about 2HC, so there is nothing more for me to tell you.

73's. CRIEFF (2XO),  
A.R.A. 3rd Zone Officer.

## ZONE 4.

The Newcastle gang are very active at present on all bands. 2ZW and 2FN are devoting most of their time to portables on 56 mc. Two 56 mc. transmitters are working at the shack of 2ZW, one consisting of a pair of 210's modulated by a pair of 47's built up into a small rack and panel, together with power supply, and can be used anywhere where 240 mains are available. There is also another transmitter consisting of a pair of 210's modulated by a pair of 250's, giving about 24 watts input. The antenna system is a vertical picard mounted on top of the two-storied building, with feeders about 40 feet long. The portable rig used by 2FN and 2ZW consists of a pair of 230's mod. by a pair of 233's entirely enclosed in aluminium. The receiver is a beautiful little job, which can almost be put into the coat pocket. Attempts have been made at long distance duplex work with varying success to date. On Sunday, 15th October, a party of hams, 2ZW, 2FN, 2KB and 2TX, set out for Carey's Peak. This is about 5300 feet above sea level and situated about 65 miles air line north-west of 2ZW's shack, and can be seen on a clear day with a good pair of glasses. The trip to the Peak is long and arduous. The party motored to Salisbury Rest House, about 14 miles from the Peak, and set out on horseback, with the gear on two packhorses. Leaving the rest house at 7 a.m., the Peak was reached at 11 a.m., and to say the least of it the beautiful mountain scenery made the trip a most delightful one. An 80 MX transmitter and receiver was immediately got into commission, and to our dismay the home transmitter, operated by 2OF,

was received at about R2, and skip was exceedingly bad. A very valuable hour was wasted endeavouring to get through on this band. Shortly after 12 noon the 5-metre gear was got into commission, and a new vertical antenna was made to replace the one which had been lost during the climb up the mountain. Almost immediately rain started to fall in torrents, and it was decided by the guide who was in charge of the party that an early start be made on the descent. The return trip was decidedly uncomfortable, heavy rain being experienced during the whole trip down to the rest house. The party arrived at the rest house at 4.30 wet through to the skin. The gear, however, was little the worse for the experience. The power supply consisted of six heavy duty "B" batteries, and stood up to the gruelling loads placed on them remarkably well.

All hands voted it a wonderful day, despite the bad luck experienced, and arrangements will soon be completed for a return trip. It is hoped that in the near future a party will go to the Peak and spend a few days up there. The position is ideal, in that a clear, unobstructed vision to the south and east can be had. Places as far away as Hazelbrook, on the Blue Mountains, are within the line of vision. It is also quite on the cards that Sydney hams will be worked, a distance of 120 miles away.

2CS has at last produced a brand new transmitter on 40 and 20 MX with a power of 120 watts. Three CQ's produced three Yanks, and a maximum signal strength was reported to be R8, QSA 5. The gang welcome to the fold 2MT, Charlie Headley, who has only been on the air a month, and has a MOPA going. Worked his first Yank and got R5, QSA 5.

2UF is also working Yanks, and has three continents and six countries to his credit. 2OC is rebuilding, and rumour has it that the B.E.R.U. Contest is being kept in mind. Owen has just completed a new modulator unit consisting of a pair of 59's "B" class. 2TX has a new 56 mc. transmitter going, using a pair of 45's modulated by a pair of 59's, and also a receiver. He hopes to do some DX work (56 MX) in conjunction with 2ZW and 2FN. We are very sorry to lose 2FX, who is now permanently in Sydney. Frank was fortunate to get into the Police Wireless Patrol. 2OF is still

rag-chewing on 80 MX with his beautiful cc. note and fb. fist. Cheerio, 73.

STAN. (2ZW),  
A.R.A. 4th Zone Officer.

## ZONE 5.

Conditions on the 80 and 40 metre bands have been only fair during the past few weeks. QRN on 80 MX has made pleasant contacts impossible, though some of the gang appear to be getting through the barrage. 40 metres has been rather patchy; reception conditions have been very bad owing to the QRN. A few weak sigs have been heard on 20 metres, but no attempt has been made to contact anyone on that band. VK2RP burst into life a short time back; but evidently the one day's activity was too much for him, as he has not been heard since. 2NS and 2RJ find time for a weekly chin-chin on 80 metres. Both Trev. and 2RJ seem always to be QRL. 2ZW and 2BP are arranging skeds on 56 mc. It's great to be optimistic, as the distance is over 100 miles; but the QRA's to be used are in sight of one another. 2BP has not recovered from the W.I.A. test yet; the strain of 90 hours from Sunday to Saturday of the test was too much. 2BP wants all hams interested in the R.A.A.F.W.R. to write to him. 2CK now measures QSO's by the mile, not by the hour. Geoff has a 1500 volt genny hooked up to the back wheel of a push bike. We visited his shack the other Sunday, and Geoff demonstrated how to pedal at 30 m.p.h. and send 30 w.p.m. on the bug at the same time. Cheerio, "gang," and a merry Xmas to all.

ERIC (VK2BP),  
A.R.A. 5th Zone Officer.

## ZONE 6.

On 80 metres conditions are really bad, static being very severe, and looks like a QSY to other frequencies until next winter. One thing that is very apparent on 80 this year is the number of city hams. Last year it was used almost exclusively by the country chaps, but they seem to have deserted lately. 2HU, 2DR, 2ND and 2ZV were on fairly consistently with good fone. Also a newcomer, 2NM, of Mudgee, was heard one night putting out some really good fone. Another old-timer has staged a comeback—2WH, of Forbes. He is working QRP fone on 80 metres at present,

about 1 watt fm "B" batts., but expects to get a motor-generator soon.

40 metres is still the same. CW, R.A.C. chirpy, D.C., Yanks with C.C. R.A.C. V.K.'s C.C. with about 70 watts to a poor old 210. Thousands of weak sigs, chaps up in the "wee, sma' hours" chasing the elusive DX. The now famous system of fone, grid modulation on a T.N.T. with an R.A.C. note. Some really FB fone with the ops playing gramophone records for hours without calling, chaps tuning oscillators right across the ham and adjacent commercial bands. Chaps calling CQ for fifteen minutes without signing, others signing every third time and calling incessantly for half an hour. (This is very prevalent in spite of all that has been written in Q.S.T. and other periodicals.) Q.R.N., Q.R.M. absolute bedlam. That is 40 metres at present. [Great stuff, 2QA! What about an article on these lines some time?—Ed. "A.R."]

The 5-point test is over. I think everyone had a good time. Some of the messages made quite interesting reading. Heard Jim, of 2PE, relaying messages at 15 WPM plus. Evidently enthusiastic again. We may hear some news again from Zone 1 soon.

This will have to suffice for now, as 2QA has been QRL "work." The first for about twelve months, and the interest has been transferred from ham radio thereto.

JACK (VK2QA),  
A.R.A. 6th Zone Officer.

## ZONE 7.

Must apologise for missing the bus last month. 2TA and 2LB have been bitten by the 56 mc bug, and for the last couple of months have been devoting all their energy (?) to work on this band. One record of about 33 yards, and through six or so walls, for readable fone has been established. 2WA has his new QRO gear going, and Jack certainly has a good show for it all. The latest report indicates that a certain ham from Liverpool, who is now with 2FI again, has changed his name from Harry to Harrie. Guess we'll have a representative at Canberra soon. 2FI is at present QRL with plenty of work, and can't get on the air much. 2EZ is still keeping the cobwebs off the good old QRP work. Jack has his transmitter going on 20 metres, but conditions there are not too promising yet. Here's hoping!

Referring to 3ML's oscillator doubler article in last issue, the circuit has been very successfully used here at 2PN, using a 59 tube. The same circuit is also applicable to an electron coupled oscillator by merely plugging in a .002 fixed condenser in place of the crystal, and grounding end of the grid oscillator coil. The rest of the circuit remained unaltered. By using this type of circuit, crystal controlled transmitters are easily rigged up for the ten metre band. So, buck in, you chaps, and help us make this summer the best 10-metre season yet.

The five-point relay contest is over. More support could have been given by some of the other States. 2UO at Wagga still has his long QSO's on 80 metres fighting against Old Man Static. Don't think the latter will lose before the summer is finished. You may wonder what some apparently feeble-minded hams mean by using 55 as an abbreviation. It is a suggestion of 7BC, to be used especially when you're in a hurry, and if you just say "55" it includes all the other business, such as "Vy 73 hope cul gud dx," and all that business. It means in all, and saves the uncomfortable long-windedness at the conclusion of a QSO.

ROSS (VK2PN),  
A.R.A. 7th Zone Officer.

## ZONE 8.

Conditions here on 40 and 80 metres have been almost unbearable for the past few weeks owing to Old Man Static. Previous to this, 40 metres had shown marked improvement, W stations being easy contacts, and PA, CT, and G's worked on successive mornings. On one occasion HB9Q was R7; but was unable to raise him. 2DN has his new three-stage c.c. job almost complete. Jack intends to modulate it Telefunken. 2JJ is heard occasionally on 3.5 m.c., and is always T9, R8. 2AK, after a long absence, is active again using c.c.

Well, gang, I hear Bondi calling CQ, so will answer the call for a few weeks.

NOEL (VK2OJ),  
A.R.A. 8th Zone Officer.

## NORTH SHORE ZONE.

Conditions during the month on 40 mx have been very favourable for DX contacts. Plenty of Europeans in the late afternoons, and W, PK, J, OM, etc., at night. Things are getting a trifle congested now on 40. Europeans are also strong between sunrise and

6.30 a.m. on 40. The 80 mx band is gradually being deserted, as QRN is digging in up there. However, there are still a good many die-hards doing their best to punch through the din.

2ND ordered a Comet Pro x.x. super from U.S.A. Better order a new lock for the shack, Norm. 2BA been toying with a big tube belonging to 2YA. Allan, of 2AH, been helping 2DR with the 5-pointer, and been punishing that bug of his quite a lot. Congrats on your WAC, Alan. An LU on 20 did the trick. 2AH has gone back to DC rx again, and is trying to wean others from AC.

Conditions during the 5-pointer were fb, indeed, both on 40 and 80 mx. A lot of time was wasted by W's answering the VK test calls, and as the Yanks were coming in as loud as our Interstate, and with their new DC sigs, it was difficult to pick them out. 2ZU, from out Epping way, entertained us on 23rd October at 7.30 p.m. with a lecture on milking cows, etc. 7.30 is evidently the country man's session!

John, of 2OZ, was very consistent, and seemed to be handling much t/c on 40. 2BP was unlucky enough to have to work on Saturday morning, thus lowering his total a great deal. 2CP, 2YL and 2FQ were all hard at it. Jim, of 2YC, is busy collecting city notes. 2UP (two up), official station of Australia's national game (hi), is active out Manly way. 2LQ, Hornsby, hasn't been on the air for years. 2VG heard a lot. What about the 40 mx fone debate, Ron? 2JY is tuning up again; hope the bug has bitten good and hard this time, OM. 2RC recently blew the dust off his rig to show it to a visiting BCL, but otherwise all quiet. Haven't heard 2ZZ start up at Asquith yet. 2GJ has been on 40 mx quite a bit, with DC sig. Len, of 2LD, is busy pounding Navy brass on one of the destroyers coming out to VK from G. Ian, of 2XC, is QRL Uni exams, but pushes the key sometimes. 2DU hasn't been on much lately; but he was happy when he landed OH3NP the other night on 40 mx. Dud has very fb. quality fone. The shack is way down below in the basement, and is a ham's paradise of gear. 2DU is building a 56 mc. rig. 2LZ is rebuilding, and intends to work all the DX on 20 mx. Alan, of 2HY, has landed some very fb. dx down on 20 mx. His bag last month was as follows:—7 G's, 15 J's,

40 K's, OH, F8, VS3, PK. When Alan and Con have strained out their bunch of DX on 20 there won't be much left over for the rest of VK. 2GU, alone in his glory at Woolwich, reports by radio. Bill's QRA is in a very pretty spot, as it overlooks the Lane Cove River on the one side, and the Parramatta River on the other side. 2QR, at Beecroft, has only had his ticket for a month, but has worked 38 W's up to time of writing. Bob has nearly worn the points of his key flat in trying to hook EAR and G with the assistance of 2NR. 2NR takes a few years' life out of my phones when he gets on the air. Camooweal Radio VJJ recently asked me to radiate on 7000 k.c. for calibration purposes, and thanks are due to Frank, of 2ER, for enabling me to put my perk right on that wave. I take this opportunity of thanking 2ER for his co-operation in giving me frequency many times. Frank has some very fine freq. calibration gear at his shack, and is building still more gear to attain even greater accuracy. 2CE attended the 18BN Army camp at Liverpool and met 2YA there. 2YA and 2DR set off for the recent Wyong field day on 2DR's prehistoric mobike. 2YA's back inscribed with the legend, "Field Day or Bust." Unfortunately, "Bust" won the day, as we didn't get further than Hawkesbury River. (See article on our adventures next issue, if we get space, Hi.) 2LZ called us after the field day and brightened us up with news of the day. Congrats to Manly club's car for lapping home first. Also fb. ZBRC car coming second. 2EH (the king of patience) called 2DR same time as Con and I asked him to stand by. This he did, and right nobly, for about an hour. 2EH was receiving on the portable rig he had at the field day, and was using a frame aerial. 2EH's QRA is 6 Orange street, Pennant Hills. Laurie, of 2SL, is back again from trip to Melbourne, and can be heard on 80 mx with good quality fone. TRF rx. Heard that 2YM will be starting up again at his new QRA at Newcastle. Would like to get still more news on my watch between 7 and 9 p.m. Friday nights, as per circular sent to all North Shore hams. Please rally round, chaps, and make this a bumper section. In conclusion, I would like to extend to the amateur fraternity my best wishes for the merriest of Xmas and a bright DXkey new year.—Don. (2DR).

## VK4 (QUEENSLAND DIVISION)

The monthly meeting was held at headquarters, Heindorff House, Queen street, Brisbane, before a good attendance of transmitting and student members.

The resignation, owing to ill-health, of Mr. W. T. Wishart, 4WT, as secretary was accepted with regret. Major Feenaghty, 4LJ, in a short speech on behalf of members, thanked Mr. Wishart for his untiring efforts during his term as secretary.

Nominations were called for the position of secretary, and finally Mr. E. Shorten, 4TS, was elected.

It was decided to hold a week-end camp on the 25th and 26th November at Mt. Nebo and Cash's Crossing.

After general business Mr. D. Laws concluded a lecture on his experiences at the Granites, which was thoroughly enjoyed by all present.

Correspondence for the Institute should be addressed to the secretary, Box 1524V, G.P.O., Brisbane.

### Jottings.

Conditions on the various bands have been only fair lately, although 20MX has shown some improvement, DX being better than usual; stations worked being OH3NP, G5HB, F8PZ, PK's and several Japs. Others heard: —OAIB on fone R4, SUIEC, OK2VA, VU2FP, and several G's. On 40 MX Yanks are still coming in strongly, and hold first place, next in order being KA's and PK's. On 80 MX can be heard ZL's and VK's on fone, but very little time has been spent on this band owing to heavy QRN.

Conditions in VK4 were rather poor during the test for the Fisk Five Point Relay. Stations 4AW, 4GK, 4DR, 4RV, 4UU, 4EW, 4JU, 4EL, 4MR, and 4YG were doing good work. VK2 signals came in solidly at times, and next in order, numerically, were VK3, 5, 7, 6. The approximate individual scores with which we were acquainted were 4AW, 670; 4MR, 50; 4DR, 305.

4GY still calling DX on 40 MX, although not so much as usual; using 3-stage xtal rig. 4UK now moved his Qra from Toowoomba to the AC area, and hopes to be on with new 3-stage xtal rig; intends keeping a self-excited mitter in reserve for fear of accidents! Hi! 4JB now talking xtal; says the old Hartley still perking O.K., but must have something more

in keeping with the times. Gch. only requires Africa for his W.A.C. African hams, please note! 4HS, another Toowoomba ham, heard on 40 MX, coming through in VIB at R7, PDC, and very steady. 4JM was heard Qso 4AW on fone on 80 MX during the last week in October at R7; speech very clear. 4AW heard very consistently during the Five Point relay calling CQ test. Arthur still using the old Hartley, but think it will not be long before he will be on xtal. 4FB says that DX N.S.G. lately; Fred complains QRM power leaks. 4RV heard R7 in VIB with T9 signal. Congrats. on your working those Africans om. 4JF using 20 MX, and heard R7 pde working PK; believe Jack is using a Hartley rig. 4WT, of Graceville, has been making a lot of alterations lately; has been trying out a system of Telefunken modulation, and has been very pleased with reports, among them being R7 from Z.L. Congratulations to the "R. Max" king, Charlie Miller, of New Farm, on securing his A.O.P.C. at the recent examination. Charlie is a very keen young man, and should do well in the amateur game. Best of luck, and hope to have the pleasure of a Qso before long. 4VJ not heard much lately, having given radio a spell for a while. Say, Vince, is there a YL in this? 4DR heard consistently during the Fisk Five Point relay calling CQ test with fb. T9 signal. 4LK and 4TY, two country members, both heard during the test, at times coming in fb. in VIB.

Cheerio es 73 Cul.

R.Y.

## VK5 (SOUTH AUST.)

The last general meeting of the W.I.A. was held on October 25. Great amusement was caused when several prominent VK5 hams were hypnotised. Other turns by the magician were greatly appreciated, and a good evening's entertainment was had by all.

The Transmitters' Section held its meeting on November 8, when Mr. Roy Buckerfield (5DA) lectured on "Modern Superhet. Construction and Design." Mr. Buckerfield, who has previously given many interesting and helpful talks, was accorded a hearty vote of thanks. In view of the fact that the trend in ham receiver design is showing a rapid increase in super-

hets., the lecture should prove of great value to those contemplating that type of receiver.

For the last three years the South Australian Section of the Royal Australian Air Force Wireless Reserve has worked in conjunction with the South Australian Aero Club at its annual pageants. Due to boisterous weather the first year, and to electrical interference at the base station the second year, the exercise did not prove a great success. This year conditions were ideal under the direction of VK5MB, District Commander. Active members of the reserve were arranged in a network at the scene of activities. At first it was thought best to use C.W., but after some consideration phone was decided on. The network was arranged in the following manner:—5MB and deputy 5MK were at the base station, about a quarter of a mile from the clubhouse, and worked from 5GO's home. At the clubhouse was Pylon D, 5ML, with assistants. At Pylon B, 5MD and 5FM were situated, and at Pylon C 5RD and 5WP.

The first test was given at 2.30 p.m., and in five minutes the whole system was working perfectly.

Whenever a plane in any race cut a Pylon the station situated there would report to the base station, who would then report to 5ML at the clubhouse, and the flier would be disqualified.

In a number of races some of the stations gave a running description of the flight that would make our local racing commentator green with envy. After the races word was sent out over the network that each member was to do an exercise in the air in a Wapiti. The dismantling of the stations and the return to the drome of the outlying stations was done in record time.

Two Wapiti planes were used, and the exercise was to be reconnaissance and estimating. Two members at a time were taken up, and seeing some of the faces when the exercise was over one would have thought the exercise was estimating "how high is up" and "how low is down."

However, the thrill of going up in an Air Force plane amply repaid members for any squeamishness they may have felt. Now that the stunt has proved such a huge success the Aero Club officials desire to install the

reserve as a permanent fixture at all pageants.

Many of us are wondering who carried off the honours in the "Fisk Trophy." Incidentally, the contest seems to have been enjoyed by all concerned, and was a great success in promoting friendships between Interstate hams, which, after all, is the main object in promoting a contest of this kind.

Conditions during the past month have been very erratic, especially on 14MC. Erratic conditions have their redeeming features, however, in the form of countries not often heard being worked during these periods. Some of the best DX heard in VK5 during the last few weeks were LU1CA, LU2ZZ, LU2DP, ON4AU, U1AI, PA0CE, F8PZ, ZU6M, ZS5X, YI7RK, G5AI, G2BM, G6WY, VE6BI, OK1WX, OK2RM and OH3NP.

Many PK stations were heard and worked. There has been a DX contest on there, and as the power used, is in most cases less than 200 volts from B batteries, one was amazed at the strength and number of signals.

## Monthly News of VK5.

5MU Malcolm Gray has been busy experimenting with the "Guyder Lock" system of xtal control; obtains fb. results on 14 MC. 5JA Phil. Brewer did a fine job in the Five Point. 5LD heard mostly on 14 MC, due to BCL QRM. Distinguished himself by working an LU on 20 MX. 5JH heard a lot on 14 MC; uses M.O.P.A.; gets out well to Europe. 5MY not heard lately; not even on sked. with expedition in Central Aust., giving wx rept hi. 5MD, best looking station in VK5, and doing a very fine job as Federal Sec. and contest manager. 5ML can work Europeans easier than Interstate in the early mornings; uses 3-stage xtal rig with eight-year-old 210 in. p.a. 5XK heard most in the early morning on 40, also on 14 MC. 5DX works consistent dx. on 40 metres, using a "Split Colpitts" oscillator with a type '10 tube. 5RP recently shifted QRA, and finds he is situated right under 33,000 volt mains. 5RT rebuilding again, this time a 3-stage M.O.P.A., using an electron coupled oscillator. 5MZ, a new ham, is getting very good results with 20 watts input to a Hartley, using a 245 oscillator. 5TX recently tried the effect of having his face in push-pull with the back of a lorry, hi; he is using a crystal rig with a 415 p.a.,

with 3 watts input from "B" batts. 5GR tired of working South America; says he would sooner work PK's. He has just installed a new rig using a pair of E406 tubes in push-pull. 5WB not heard much on 40 metres these days, but his excellent transmission on 200 more than makes up for his absence from short waves. 5YK has changed from a flat top to a vertical antenna; says his reports are 3 points better in all directions. 5ZY has a very powerful signal on 7 MC; gets his share of dx. 5WR, one of the oldest active hams in VK6, has been on 14 MC with one of the best self-excited signals heard on that band. 5UK has the perfect PDC note, and, believe it or not, he gets it from a Hartley using a 245 oscillator. 5PS, another new ham, whose QRA is W. Parsons, 114 East terrace, Adelaide, is using push-pull 245's. 5KG is another using push-pull 245 tubes. 5MF is so busy building receivers that he has no time to build one for himself. How's the red-headed yl, Al? 5PK has "big fella" in final stage, and pumps 1.8 amps into full wave ZEPP. 5LB has a bell-like note and a perfect fist; heart few nights ago on 14 MC with T9 sig. 5LP making several changes. 5JO building new shack; has a 3-stage xtal outfit with an E406 final. 5RH doesn't find City a patch on Jamestown for dx: is using M.O.P.A. with 245 P.A. 5KH is busy experimenting with condenser mike, also has 3-stage direct coupled amplifier. 5BY has been doing a lot of duplex fone on 200 with 5WS. 5BP experimenting with mikes, also constructing a portable rig. 5MB very busy with A.O.P.C. classes; Merv. has turned out 45 hams now from his school. 5GK has new 3-stage xtal rig; he has been experimenting with eliminator bias. 5GW heard working plenty dx with his usual ease, using push-pull 210's.

Hope all you fellows are giving "Amateur Radio" the support it deserves. What have you for next issue?

73. VK5FM.

## VK6 (WEST AUSTRALIA)

The monthly meeting of the W.I.A. VK6 Division was held on November 16, and was presided over by Mr. Coxan (6AG).

Business was finished, after which a question-and-answer period was tried out. It brought to light many a little shady point, and next time, I think, the gang will be looking forward to a more lengthy time in which to discuss their troubles. The main topics were antennas, doublers and parasitic oscillations.

In the course of business Mr. R. W. Muir, of Wagin (6RW), was elected as a full member of the W.I.A. We wish him the best of luck, and look forward to hearing a healthy sig pounding from that direction.

It has been decided that the general meeting for December will be held, as usual, on the 21st, and the shack meeting will be held on the 7th.

VK6KB has his work cut out trying to pacify a local B.C.L. Poor Val., he has just been married too. 6JK also not heard too much lately. Isn't that neighbour's dog dead yet? 6FO is still trying to reach the clouds with his new stick. Better luck with this one, om; and when you get qsk with the Air Force skeds come back and do a bit of dx. 6MN heard putting out some fb. phone on Sundays. Hw abt that Sth American syd, om. 6GM busy with new electron coupled job. Expects to make a big noise shortly. 6CP, about that receiver? 6LJ says it is the cricket that keeps him off the air, but what abt the yl's. 6RL will shortly be bursting forth with a new xtal sig. 6KR having a round or two with parasitics. Says they are handy fellows to have around. 6LK still deciding about the new rig.

## NORTH SUBURBAN RADIO CLUB (VK3FY)

On the evening of November 11, 'mid tense excitement and enthusiasm, the gang at 3FY conducted a most memorable all-night broadcast, commencing at 11.30 p.m. In the early hours of the morning duplex telephony was conducted with 3RI, and later on 3HF made it three-way.

At 4 a.m. Harry (3HF) complained of the cold, so we sent a car to bring him to 3FY's clubrooms. At 4.30 a.m. 3RI's gang decided to come over to 3FY per Sid. Harris' car, so a party of twenty-two sat around the mike at 3FY; and, believe me, it was a picnic. Did anyone hear it? Our

first report came from Czechoslovakia, describing the singing as Oriental—hil

At the general meeting held on the 13th inst. Mr. C. Harris gave a very interesting talk on "Power Supplies."

**Special.**—On December 1, 2 and 3 3FY will operate a portable at Boronia on 40, 80 and perhaps 222 metres. Messrs. Stow (3AS), Pinkney (3OQ), Maher (3FZ), Gleeson, O'Brien, Dowling, Stobie and Wonder will be operating the transmitter. Batteries will be used for high tension. A call from the local gang will be appreciated.

Slow Morse transmissions are being conducted from 3FY every Wednesday evening from 8.15 till 9 p.m., so here is a chance for the novice to learn Morse code; and it's free.

The meetings for December will be held on the 4th and 18th inst. at the clubrooms, 354 Rathdown street, North Carlton, to which all enthusiasts are invited.

W.W.

## VICTORIAN QSL BUREAU

Cards for the following stations are on hand at the Bureau, 23 Landale street, Box Hill:—

3AH, BX, CP, CW, EM, EP, FC, FJ, GU, GX, JG, JM, JR, JX, KG, KQ, LM, LP, LS, LY, MH, MI, MM, NC, NM, NR, OZ, PA, RB, RQ, RS, RT, RW, TP, UJ, WH, WO, WY, XK, XX, YR, YW, ZL, ZY, Messrs. Adams, Henriksen, Mawman, White, Oliver, and VKCN.

Stations having standing arrangements for the disposal of cards are not included in the above list. All cards may be obtained by forwarding a stamped envelope. Stations are reminded that cards unclaimed after the expiration of six months from date of receipt are returned to the senders.

FM8IH QSLs!!!!

The seemingly miraculous has happened. Whether due to burning ears, as the result of world-wide imprecations cast upon him, or to the gentle persuasion of his YF (we understand he has recently acquired one of these) or to an uneasy conscience, the fact remains that FM8IH QSLs. A few cards from him dribbled in by the last European mail, and stations who have restrained their impatience over the last two years should not allow them-

selves to become unduly exhilarated over the occurrence until FM8IH's Qsl-ing reaches a more advanced stage.

ZL3AR (D. W. Buchanan), an old-timer who is still very active, passed through Melbourne on November 16, enroute to Adelaide, where he meets his YF, who is returning from abroad. On the trip from Sydney to Melbourne he was fortunate enough to be domiciled in the same railway compartment as our genial ex-Federal President (Mr. Stan. Gadsden, VK3SW). Stan. was quick to discern ZL3AR's identity, and in his inimitable hospitable manner succeeded in turning ZL3AR's few brief hours in Melbourne to the best advantage. Arrangements are being made for ZL3AR to meet more of the VK3 gang on his return through Melbourne. Sydney hams will have a better opportunity of making ZL3AR's acquaintance, as he expects to stay in Sydney for one week, and his whereabouts may be located from VK2TR.

VK3RJ, Qsl. Manager.

## A.R.A. FIELD DAY NOVEMBER 5, 1933

Now that the A.R.A.'s second field day is over, one can sit back in comfort and relate a few of the happenings on that day.

Once again it fell to the lot of the Wyong gang to organise the main portion of the field day, and 2OC, 2TX and 2CK selected Towoon Bay at the entrance, as the most suitable place for this location. Eleven cars and a motor cycle set out about 8.30 a.m. on November 5 from V.I.S. The trip up was quite uneventful for the cars, but, as usual, the mo-bike caused trouble, and old 2DR and 2YA walked back from the Hawkesbury. It's a pity the victims were so keen on bringing home the bacon; but that was not to be. Most of the cars carried five-metre equipment, as well as the 80-metre gear. 2HL and 2LZ and supporters in 2HL's car had aboard two five-metre receivers, one five-metre transmitter, and an eighty-metre receiver for D.F. The Leichhardt gang also had a five-metre transmitter and receiver, as well as the D.F. gear.

Manly Club was represented by two



cars, one containing 2NB, who had an output metre fitted in the D.F. receiver, and this car was to eventually collect the cup. Zero Beat was there with three cars, and the usual FB gang.

After reaching Tuggerah, signposts had been erected inscribed "A.R.A. Q.R.D." at every cross-road. This was just another indication of the thoroughness with which the Wyong gang carried out their job. The first sight to greet us on arrival was the Newcastle gang—2ZW, with his QRO 5-metre outfit going, as likewise 2FN. After much rushing about by 2HL with an absorption wave meter, it was decided that the Newcastle and Sydney gang's idea of the position of five metres in the spectrum didn't coincide, and after some little argument they decided that the V.I.S. gang knew where five metres was and the Newcastle gang adjusted their gear accordingly. 2YM (Dickie Cohen), now an aunt, or is it an uncle, at B class 2KO, renewed acquaintances with all his old pals of V.I.S. After much testing of receivers, the bell rang, and, leaving wireless for the moment, the products of the Wyong district were tested straight away. After that the boys watched the dicky bird and then the main event.

The transmitter experts then left to install the 80-metre transmitter and 5-metre transmitter, and meanwhile receivers were overhauled. 2UX, our genial president, had charge of the barrier and issued envelopes containing maps of the district, and instructions, to be opened at 3.30 p.m., if the transmitter wasn't located. At 2.30 the field moved off, quite a good start, over a dozen cars leaving. The cars for the time being wandered about here, there and everywhere, taking bearings, etc., until at 4.13 2NB and the villagers found the transmitter, some six miles away from the starting point. The transmitter was surely hidden, and no wonder so many gave up the search. The Manly gang, although they were three-quarters of an hour overtime, were duly presented with the cup. An amusing incident occurred as they were approaching the hidden transmitter. Bob Power (our secretary) opened their envelope (at the hostelry of mine host at the entrance), and set out to find the transmitter at 4 p.m. They nearly caught up to the Manly car, who thought that Bob's car was also in the running. When the 2NB crowd

reached their plotted point they rushed out of the car and up the hill, thinking they were to be beaten on the post. However, in any case, they were in first, and were heartily congratulated.

When all the cars returned tea was taken, and during the tea thanks was expressed for the wonderful way in which the Wyong gang had organised, including the signposts ("A.R.A.'s," "O.M.'s," etc.), and if three finer "hams" can be met anywhere in this globe than 2OC, 2TX, and 2CK we will go a long way to see them.

Thanks to Bob Power and Stan. Grimmett (2ZW), who managed the Sydney and Newcastle ends respectively.

Eighty-seven hams and supporters were present, and that is a few more than the last time. Gear and other sundries were packed and everyone left with the idea that they had attended a perfect field day.

Just one more point. Determined to find out where 2YA and 2DR disappeared to, 2DR's shack was visited on the way home, and it was learnt that the bike refused to go uphill. Anyway, these mo-bikes are a darned nuisance when owned by VK hams.—(2LZ).

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### FIVE METRES IN N.S.W.

By VK2PT (A.R.A.).

Judging by the enthusiasm displayed by a number of hams in N.S.W., it would appear that this band has at last come to stay, largely due to the higher efficiency of necessary components, particularly valves, and a better understanding of the ultra high frequencies. In the years gone by these ranges of frequencies were rarely thought of by the average amateur, but we have proof that one or two did attempt some experiments. Unfortunately, the idea just failed to appeal to the majority of the amateur fraternity, doubtless due to the fact that results were anything but attractive. Since these activities, however, experimenters in various parts of the world, particularly in America, have doggedly clung to the task of improving and simplifying the gear, in order to achieve something worth while. To-day, then, we have an enthusiastic band of amateurs who are following along the lines indicated by these pioneers, and the results are very gratifying, and, to say the least, attractive. To these experimenters a vast field of improvement is yet fac-

ing them, and almost insurmountable difficulties appear, but that old amateur spirit will assert itself and lead us to something very definite. Already we have a large number of enthusiasts in Sydney and suburbs who deserve mention. They are as follows:—VK's 2NO, 2SA, 2XY, 2PT, 2RQ, 2MW, 2WD, 2FA, 2DW, 2WE, 2YX, 2LJ, 2HW, 2FO, 2PS, and 2LZ. These stations are regularly heard on "five" with good quality speech, and in most cases, clean carriers. The most notable of which are 2NO, to whom great credit is due for his excellent articles and helpful advice. 2SA and 2FA, I believe, hold the dx. record with duplex across Sydney, Bondi to Drummoyne. 2FA has carried out some interesting experiments in conjunction with 2MW, 2WD and 2SA from an aeroplane. 2XY is probably the most heard 5 mx. station here in Sydney, due to his location, which I understand is on the top of South Head. He is heard in every suburb in Sydney with great punch. I wish to point out that the achievements of those stations whom I have not mentioned here are in no way belittled as a consequence of the above performances. Location is everything at the present stage of these tests, height being the dominating factor, but it is anticipated that the time will come when greater performances will be obtained by ground communication in any location; such is the ultimate goal.

Among the various circuits employed, push-pull and unity coupling would seem to be the most popular, although results have emanated from the Colpitts in a few cases. Types of tubes used in the oscillator are chiefly 171A, but 45's, 210, 230, 201A are also used, 247's and 233 invariably are the modulators.

The Pickard is a popular antenna, but half-wave Zepps make quite good radiators. QRO to date has not proved beneficial, as inputs of 3 to 30 watts show nearly as good performance.

Probably the greatest question which confronts the five-metre enthusiasts is the receiver. The super-regenerative holds sway at present, with an occasional self-quenching detector type rx., but these types are frowned on by the hams. Too much amplification cannot be added on account of the heavy hiss which accompanies or entirely blots out the weaker signals. The superhet is probably the way out, but as yet this has not

been attempted (and we shall find space for the hook-up.—Ed. "A.R.").

More cannot be said at present about this band here in N.S.W., but let it be said that with the enthusiasm aroused as it is, before long some interesting data will be obtained.

## A HIGH QUALITY AUDIO AMPLIFIER

By Bruce Mann, Quambatook.

### Part I.

Every ham has doubtless had the urge, at some time or another, to build an amplifier with a fidelity beyond that provided by the average two-stage transformer coupled job—something that could be used as a first-class speech amplifier, or else to delight the BCL members of the family. The following outfit is described in the form for which it was originally designed—for high quality reproduction of records.

The circuit is an adaptation of the well-known Loftin White, and uses an S4VA tube, followed by an E408N. It will be found in no wise temperamental, but as some of the adjustments are critical, and even vary from time to time, it has been found best to use a variable resistor to vary the S4VA screen voltage and an 0-50 ma. meter in the plate of the E408N. The resistor should be varied until the plate current of the E408N is normal, i.e., 30 ma. It will be found that a 20,000 ohm potentiometer across portion of the voltage divider will do the job perfectly. Now, varying the screen voltage varies the plate current of the screen grid tube, which alters the voltage drop across the coupling resistors (normally 200 volts), and this, in turn, varies the grid bias on the E408N. As 200 volts is an impossible voltage for the bias on the E408N, its C.T. is connected to a point on the voltage divider negative by 166 volts in respect to the coupling resistors tap, thus leaving the required -34 volts on the grid of the tube.

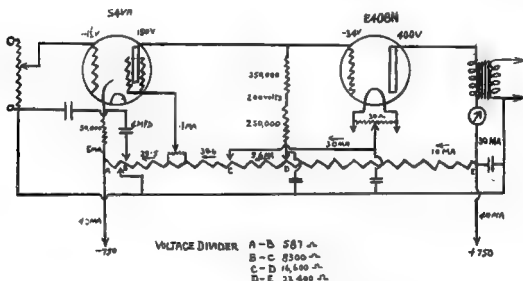
The cathode circuit of the S4VA is a stabilising arrangement which provides for hum balancing. The 50,000 ohm bias resistor gives 25 volts bias, when only -1½ are required, so the 23½ volts are balanced out by tapping

down the voltage divider. This really has a compensating effect, as anything causing a variation in the screen grid plate current is partly balanced by an opposite variation in screen grid tune bias. Thus any inclination to motor-boat is nullified. Now any hum that is introduced into the circuit by the AC component across the bias resistor can be balanced out by introducing the required amount of hum, 180 degrees out of phase, with a 4 mfd condenser connected to a suitable point on the voltage divider.

Very little has been written about

the use of multiple dynamic speakers, but it will invariably be found that, even a carefully designed amplifier will sound commonplace when used with only one speaker alongside a similar job using multiple speakers. In conjunction with an article such as this, a short review on the advantages of multiple over single speakers will not be out of place.

[The second part of this article will be published in January issue. The data to be presented is hitherto unpublished, and contains some excellent information.—Ed. "A.R."]



## Frequency Multiplying Circuits

By Maxwell Howden.

The interest created by 3ML's circuit published last month was tremendous, and when I heard that he had been unfortunate enough to fracture three crystals it seemed time to make some serious investigation. So, after we had borrowed one of the thermomillimeters from the W.I.A. we went along to his shack for a night's experiment.

The first attempt to see the wonderful output obtainable at the harmonics of the crystal proved abortive. But then, who ever heard of any ham's gear that would work properly when on show? The C.O. would oscillate

well, but the harmonic output had gone, so the millimeter was connected in the crystal circuit. The meter showed that the crystal was approaching the danger mark. After some discussion we decided that the wire-wound grid leak was the seat of the trouble. When it had been replaced by a carborundum resistor the strain on the crystal was reduced by at least 50 per cent. Then things started to hum, as the saying goes. Several watts showed up at the second and third harmonics, with about 400 volts on the plate of the tube. All this does not take very long to tell,

but it filled in a very interesting evening. As 3ML had a schedule, and I felt like a good night's sleep, we left things as they were for the time being. However, I was able to borrow one of his spare Mazda penthodes, and have since been able to carry on with various lines of the experiment here. By using series feed, instead of parallel, the possibilities of such troubles as were experienced at 3ML's were done away with. Results came thick and fast, and quite respectable output was obtained on twelve-and-a-bit metres, using a 40-metre harmonic crystal. A slight rearrangement gave about 1 watt output on 10 metres at the fourth harmonic. This seemed promising, so after some battery bias had been tried and found to reduce the output very considerably higher power was applied to the plate. At 600 volts all went well, and a resonance indication could be obtained on the fifth harmonic on 8.4 metres. Then 750 volts fractured the crystal! A return to 600 volts, and another 42-metre harmonic crystal were then tried, but with a thermo-galvo instead of the lamp across the single turn loop, and this gave a five degree movement of the needle on lower harmonics. The very free harmonic oscillation on the third harmonic of the crystal itself showed promise of producing oscillation at the fifth harmonic, such as was obtained at 3ML, and several crystals were tried. Most of these were Y-cut, and they all oscillated at harmonics that they were not known to be active on. One was finally selected that would oscillate freely on 25 metres, and with this a good deflection of the galvo needle was obtained on the fifth harmonic of the oscillator (that was actually the 25th harmonic of the 125-metre crystal) on five metres. This was just showing signs of being really interesting, and preparations were being made to see if anything could be put into a five-metre aerial when that crystal fractured too. VK3ML had already stated that he could get no harmonic from the oscillator (oscillating at the fundamental of the crystal) when it was fractured at that harmonic, and so tests were then made with these fractured crystals to verify this. Sure enough, this proved to be so in most cases, and in all for all practical purposes. However, one crystal under test gave a little output on 40 when oscillating at 120 metres, but the fracture is very small, and

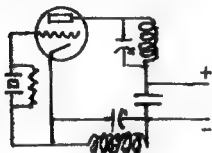
this may be a fifth harmonic, and not a third harmonic fracture. This would seem to indicate that in a normal frequency doubler it is the actual harmonic of the crystal that is amplified, and not the harmonic of the oscillator valve, as has sometimes been suggested. A commonsense viewpoint on this matter leads one to suppose that it depends entirely on the amount of regeneration in the circuit.

The next item to be considered was how to reduce the feedback until it was not so damaging to the crystals. Rehashing the circuit on paper soon showed that the only difference between this circuit and our old friend that was used several years ago to double and treble in the crystal oscillator is that the fundamental plate coil is placed in the neg. H.T. lead, instead of the positive, and that, together with the cathode, being above earth potential, gives the old split Hartley circuit. The figures (a), (b), etc., show how we get back to our old friend by simply changing series to shunt, and then back to series feed again in the positive lead. Automatic bias has also been introduced in Fig. (c). The experiments were carried on with this circuit, and there is no doubt that the greater output of the pentode tells a greater story in this frequency-multiplying circuit than even in the normal one. No high power tests have yet been carried out, but with 400 volts on the plate the output at the third harmonic of most crystals is as great as, if not greater than, with (a), and this is due to the fact that most Y-cut crystals have a very pronounced third harmonic. It has been found that as a rule when oscillation at the fundamental is started by the tuning of the large lower tank, and the smaller one tuned, the crystal starts oscillating at its third harmonic, and the condenser in the main circuit can be turned through 50 degrees without materially affecting the output. Maximum plate current in the first instance, i.e., with the fundamental tank tuned, was about 28 mills., while, when the small tank circuit was tuned to the third harmonic, the plate current went up to 35 mills. A single turn 3 in. loop across a lamp showed a dull red in the latter at five inches from the small tank that was at right angles to, and six inches from, the main tank inductance. Time has not permitted of

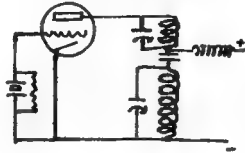
tests being carried out to produce the fifth harmonic in this manner, but it should be equally possible, and the harmonic drive from this circuit should be at least nearly as great as with circuit "a," while the strain on the crystal is much lower. It will be interesting to see the effect of a fur-

ther smaller tank tuned to a higher harmonic, as in Fig. (d).

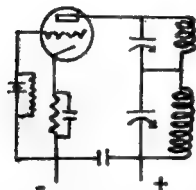
For those intending to use an arrangement like this for 10-metre work (or later five metres) I would recommend the use of circuit "c," as the C.O., driving circuit "a" as the frequency multiplying amplifier.



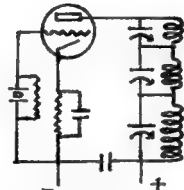
a.



b.



c.



d.

## R.A.A.F. Wireless Reserve Notes

Federal Notes, by the C.O.

The third broadcast for the Ramsay trophy will be held on Sunday, December 3, from headquarters station 1A1. The times will be as follow:—On 4155 kcs at 1015 hours; on 6555 kcs at 1100 hours, and on 14 mc at 1200 hours, E.S.T.

Apart from the fact that none of the previous tests have been satisfactorily received, owing to adverse conditions, excellent practice has been made available to reservists. A rough glance over the copies received after the three tests indicates that the standard of operating of those participants is very high, and it's going to be difficult to choose the winner. However, there are tricks even in procedure, so it is hoped that someone will fall down on one of them!

It is very unfortunate that several District Commanders have failed to submit notes for this issue. Ample time has been given to them, and it is not proposed to offer any excuses for the non-appearance of those districts not represented here. It is understood that the West Australian notes have been combined with the W.I.A. notes this month, but they should be separate next issue.

It is a confirmed fact that the efficiency of the reserve depends upon the amount of practice that the members get in the handling of traffic. As in any study, in order to achieve a certain standard, it is necessary to put all theoretical knowledge into practice. It has been found that R.A.A.F. message procedure is not the hardest study to forget! Then again it takes varying amounts of

time to teach a large number of people a subject, that is admittedly complicated, especially by the methods that we have to employ. Consequently, it may come fast to some and slow to others, but in either case continual practice is essential for a thorough understanding of the fundamentals of service procedure.

In order to incite members to originate more and more traffic, so as to keep a definite flow going, it has been arranged with the editor of "Amateur Radio" to make a small but honourable award in each issue of the magazine for the district that puts up the biggest total. Then again intersection rivalry will be developed by making an award to the best section also. Last, but not least, the man who puts up the biggest total monthly will also be rewarded. The awards will take the form of (a) a small crown, (b) a plume, (c) a star, for the district, section and individual respectively. These will be listed at the top of the page carrying the Federal Notes, with the call signs shown opposite the award.

It will be seen that only originated traffic can be taken into account here, because, in accordance with the reserve organisation, each section member is permitted to contact only those in his section and his section commander. Therefore his scope as a relaying station is limited.

In order that the membership may be put on the same basis in all districts, it is intended to make the district totals on a membership total basis. That is, the total for each district will be divided by the number of members of that district. This will equalise the districts. However, the section and individual award will be straightforward, unless the section is incomplete, then the S/C will divide his total by the number in his section.

When returning the totals monthly each member should supply his section commander with a brief summary of his activities during the month. The S/C will forward these to the district commander for use when compiling his district notes, together with the sum total of his section, and the individual totals and call signs.

The following rules are to be adhered to in connection with the above awards. Any departure may mean disqualification of the whole district.

1. The award will commence on

1/1/34, and the first will be made in the February issue.

2. Each message originated will count one point.

3. A report on activities must be made when submitting traffic totals to S/Cs and D/Cs.

4. Messages can be addressed to any member in your district, but must be transmitted through the correct channels. The nature of the traffic should be pertaining to radio and reserve.

5. The membership total ratio will be based on the number of members reporting each month, and not on the full strength of a district.

6. Reports and totals should be forwarded to your S/C at such a date that will give him time to forward to the D/C, who has been instructed to hand reports into this headquarters no later than the 23rd of each month.

7. The individual totals will be taken into account next year, when awarding the Ramsay trophy.

R. H. Cunningham, Pilot Officer,  
Commanding Officer, R.A.A.F.W.R.  
11/11/33.

I have been asked by the Air Board to extend seasonal greetings to all district commanders and members of the reserve, and it is their earnest desire that the reserve continue in that genuine amateur-like spirit that has earned for the reserve the name it has to-day.

## SECOND DISTRICT NOTES (D.C. VK2BP-2Z1).

The reserve has been taken to heart in this district, as shown by the number of applicants received lately. There also have been many inquiries over the air, and it is to be expected that, with a membership of about 35, well-organised and trained operators, VMB will be hard to catch when it comes to seeking the proposed monthly awards. The idea sounds good, and should prove a great aid to not only district commanders, but to each man himself. The reserve is particularly strong in the country districts now, as it should be, and circulars have been sent out to potential members, arranging watches for the purpose of giving preliminary training instructions. From now on this district will train on the 75-85 metre band at 1000 hours (10 a.m.) E.S.T. Listen for a VMB call from 2Z1. It is expected that in a very short space of time call signs and frequencies will be allocated and the reserve will be functioning



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121	1 mf.	6	3	1½	1500	
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officially in N.S.W. With a new year in sight, we have a lot to look forward to. Having this opportunity, I should like to extend Christmas and New Year greetings to all members.

## THIRD DISTRICT NOTES

(D.C. VK3UK-3Z1).

It was unfortunate that the Ramsay trophy contest again proved a failure, as far as Victoria was concerned. Consistent bad luck seems to be dogging the test. This time a combination of exceptionally bad conditions and a sticking relay made "solid copy" an impossibility. The test was put out on three frequencies simultaneously, but on none of them was the signals more than QSA 3/4. The 14520 kc. signals were inaudible for the country stations, the 6555 kc. signals were R3 fading out, and the 4000 kc. signals were R 8/3. An examination of the reports indicates that better reception was obtained by all stations from the commanding officer's own transmitter. Although the tests, as competitions, have proved abortive, from an instructional and interest point of view, they have been very successful, as they have given all stations some wonderful practice in copying traffic under difficult conditions.

As will be seen from the commanding officer's notes this month, a traffic contest is to be run monthly in conjunction with "Amateur Radio." This is a wonderful idea, and it should help to increase and maintain efficiency better than any other method. In Victoria we have always aimed at keeping as much traffic moving as possible, and in our annual contest for the "crack" section, traffic totals are taken largely into account in the awarding of points. However, since we have heard of the new scheme, which commences in January, we have been formulating plans for increasing our monthly message totals, because we are determined that we will put up unassailable figures each month. Inter-district, inter-section, and inter-station rivalry will be intense, and the reserve as a whole should benefit immensely, as the spirit of competition will be rife throughout Australia.

A number of new members have been signed up this month, and our traffic nets will soon be embracing a great deal of new territory. A district map is in the course of preparation, with each section's net shaded in different colours, so that the most

direct method of routeing traffic will be apparent at a glance when conditions are bad.

On November 19 the term of office of the first section commander in each section expires, and they are all to be highly commended for the wonderful increase in efficiency that is noticeable in each section's work. They have set a high standard for the men succeeding them to live up to, and it is apparent, even at this early date, that the task of selecting the best section commander for the year 1933-34 is going to be an extraordinarily difficult one.

As the year is drawing to a close, I take this opportunity of thanking all members for their enthusiasm and whole-hearted co-operation during the last twelve months. There is no organisation where section "teamwork" is of such paramount importance as in the reserve, and it is only when the solid work and enthusiasm that has been evinced is present that we can hope to maintain the high standard required of us. By regularity on schedule and by making a conscious effort to improve our procedure, not only will we put the third district at the top of the list, but also we will do our share towards making the reserve as a whole a completely efficient unit.

In conclusion, I wish all members a very merry Christmas and a happy and prosperous new year.

## 10 Metre Band

J1EZ,

Oct. 8, 1933.

VK2YC.

Dear OM:—

I red ur letter dated Sept. 11, asking for 28MC schedule.

I have been also calling "CQ ten" on every Sunday during this summer, fm 0100 GMT. hi!! But, nd!! sri om.

I wl continue this schedule for this winter, and hope to touch with ur side in near future.

I wl call "CQ ten" every Sunday fm 0100 GMT. fr abt 10 minutes, and wl send fone fm 0200 GMT for abt 20 minutes.

Will you please qsp this fact to ur 28 mc fan, om?

My xmtr is of cc. 20 w. input, and wl be modulated 100 per cent. when fone is tried. Hpe to cul, om. Vy 73.

K. KASAHARA

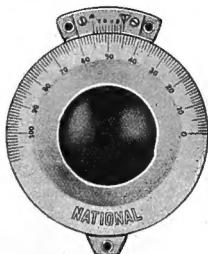
J1EZ.

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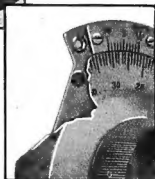
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● RADIOTRON Type 864 is a 3-electrode tube of the general purpose receiving type, especially desirable in services where freedom from microphonic disturbance is required. Filament volts, 1.1. D.C. maximum plate volts, 135.

● RADIOTRON Type 865 is a 7.5 watt screen-grid, low-power transmitting tube for use as a radio-frequency amplifier, especially for frequencies above 3000 kc. It is also very useful as a crystal-controlled oscillator. Filament volts, 7.5. Maximum plate volts, 500.

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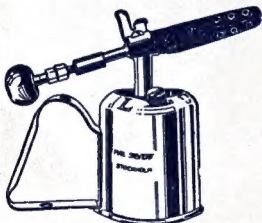
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